

VTS Process Photodiodes

VTS PROCESS LOW CAPACITANCE, LARGE AREA PHOTODIODE

FEATURES

- Visible to IR spectral range
- Excellent QE - 400 to 1100 nm
- Guaranteed 400 nm response
- Response @ 940 nm, 0.60 A/W, typical
- Useable with visible and IR LEDs
- Better than 1% linearity over four decades of illumination
- Moderate shunt resistance
- Low capacitance
- Fast response

- Choice of three styles:
 - bare chip*
 - 6" flying leads*
 - 1" anode buss wire*
- Large area cells
- Solderable contacts

PRODUCT DESCRIPTION

This series of planar, P on N, large area silicon photodiodes is characterized for use in the photovoltaic (unbiased) mode. Their excellent speed and broadband sensitivity makes them ideal for detecting light from a variety of sources such as LEDs, IREDs, flashtubes, incandescent lamps, lasers, etc. Improved shunt resistance minimizes amplifier offset and drift in high gain systems. The solderable contact system on these photodiodes provides a cost effective design solution for many applications.

Part Numbering System For VTS Process Unmounted Cells

VTS_XX

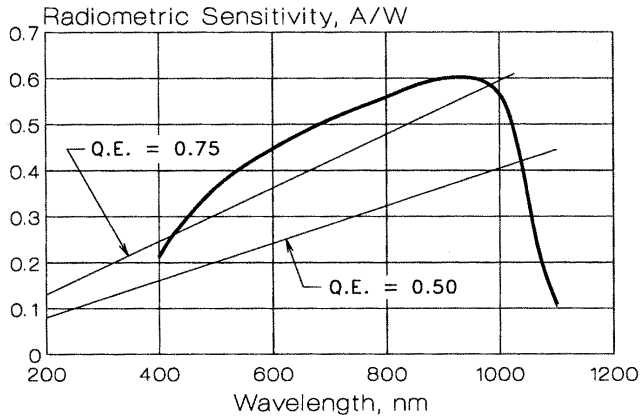
Last two digits identify
chip size and process

- | | |
|------------------|---|
| VTS <u>2</u> 0XX | Bare chip with no wires or coating. |
| VTS <u>3</u> 0XX | Chip with red and black AWG#30, insulated, flexible wires soldered to the contacts. |
| VTS <u>3</u> 1XX | Chip with a buss wire soldered to the topside contact. |

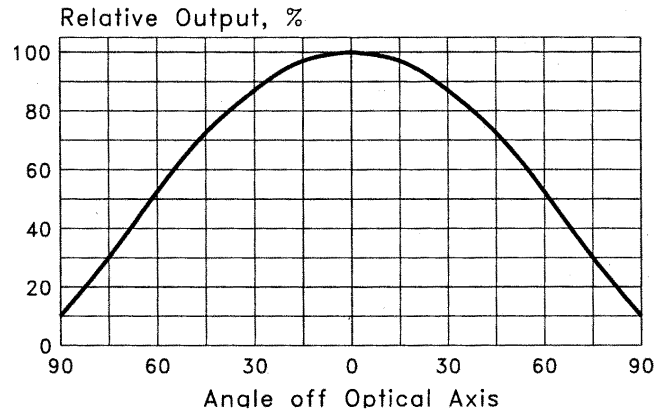
VTS Process Photodiodes

TYPICAL CHARACTERISTIC CURVES @ 25°C (UNLESS OTHERWISE NOTED)

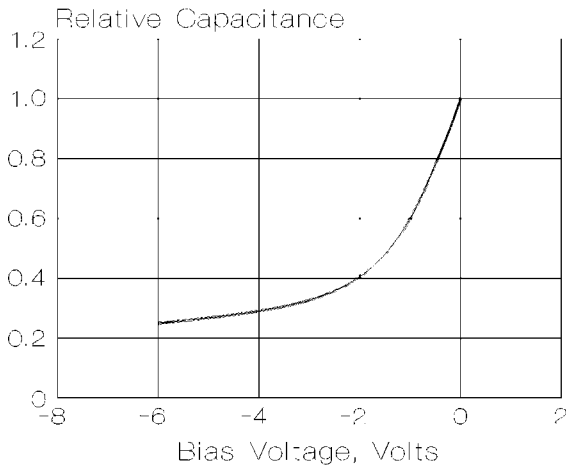
Absolute Spectral Response



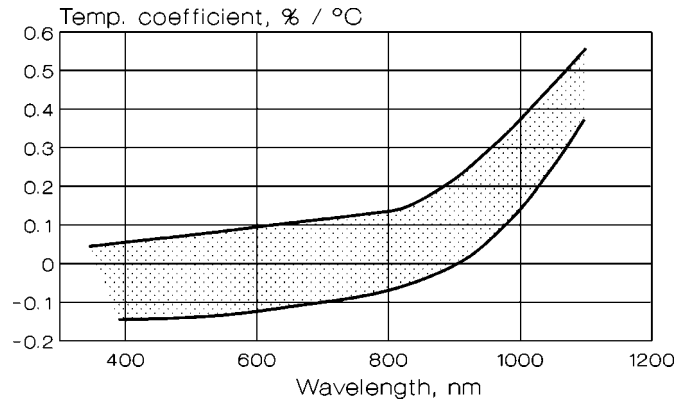
Angular Response



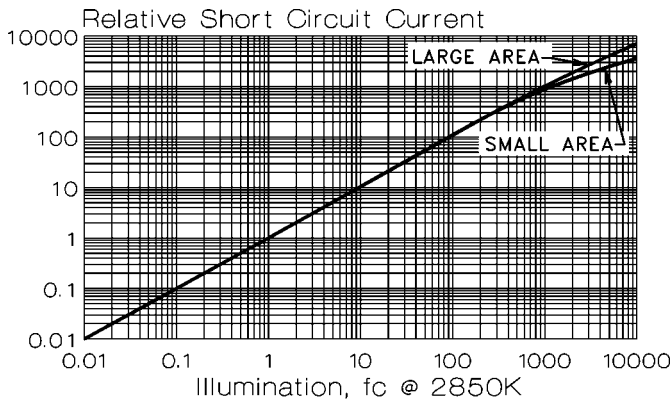
Relative Junction Capacitance vs. Bias Voltage



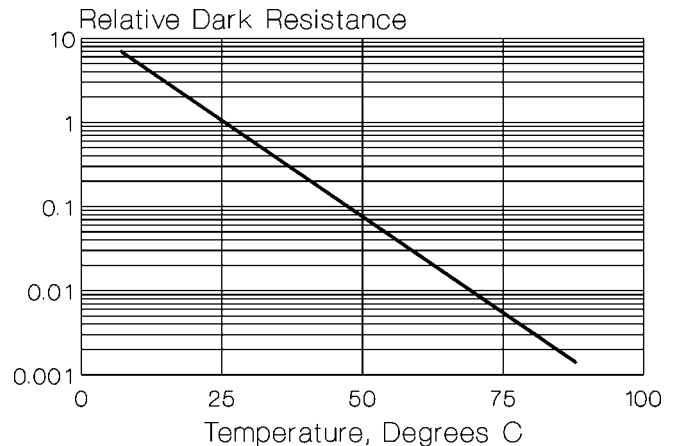
Temperature Coefficient Of Light Current vs. Wavelength



Relative Short Circuit Current vs. Illumination



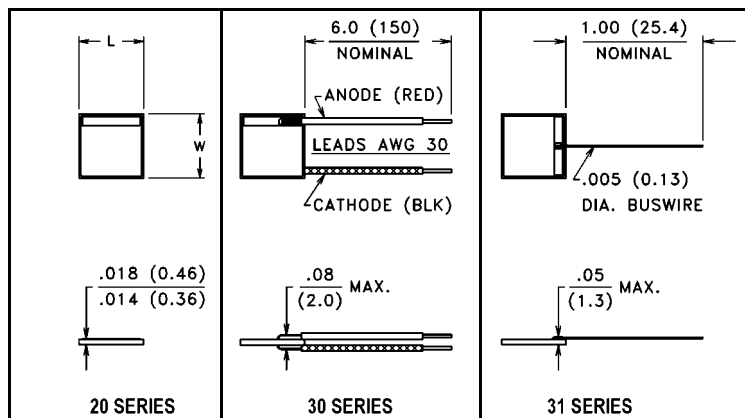
Relative Dark Resistance vs. Temperature (Referred To 25°C)



PRODUCT DESCRIPTION

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PACKAGE DIMENSIONS inch (mm)



ABSOLUTE MAXIMUM RATINGS

Storage Temperature:

-40°C to 150°C Series 20, 31

-40°C to 105°C Series 30

Operating Temperature:

-40°C to 125°C Series 20, 31

-40°C to 105°C Series 30

Reverse Voltage:

6.0 Volts

CASE 44A
ANODE (ACTIVE) SURFACE SHOWN
CATHODE IS BACKSIDE

DIMENSIONS	VTS_80	VTS_82	VTS_85
L	.800 (20.32)	.400 (10.16)	.200 (5.08)
W	.800 (20.32)	.400 (10.16)	.200 (5.08)
ACTIVE AREA	.607 ² (392 ²)	.144 ² (93 ²)	.032 ² (21 ²)

ELECTRO-OPTICAL CHARACTERISTICS @ 25°C (See also VTS curves, page 67)

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	VTS_80			VTS_82			VTS_85			UNITS
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
I _{SC}	Short Circuit Current	H = 1000 lux, 2850 K	2.30	3.00		0.55	0.69		0.13	0.16		mA
TC I _{SC}	I _{SC} Temperature Coefficient	H = 1000 Lux, 2850 K		0.20			0.20			0.20		%/°C
I _D	Dark Current	H = 0, VR = 100 mV		0.2	1.0		0.05	0.2		0.02	0.1	µA
TC I _D	I _D Temp. Coefficient	H = 0, VR = 100 mV		+11			+11			+11		%/°C
R _{SH}	Shunt Resistance	H = 0, VR = 10 mV		0.3			1.2			3.0		MΩ
C _J	Junction Capacitance	H = 0, V = 0 V, 1 MHz		7.5			1.75			0.50		nF
S _R	Sensitivity	@ 400 nm	.18	0.20		0.18	0.20		0.18	0.20		A/W
Re	Responsivity	400 nm, 0.18 A/W		0.70			0.16			0.04		A/(Wcm ²)
TC V _{OC}	Sensitivity @ Peak	925 nm		0.60			0.60			0.60		A/W
t _R /t _F	Response Time @ 1 kΩ Load	VR = 1 V, 830 nm		13			3.4			1.2		µsec
V _{OC}	Open Circuit Voltage	H = 1000 Lux, 2850 K	0.25	0.45		0.25	0.45		0.25	0.45		Volts
TC V _{OC}	V _{OC} Temperature Coefficient	H = 1000 Lux, 2850 K		-2.6			-2.6			-2.6		mV/°C

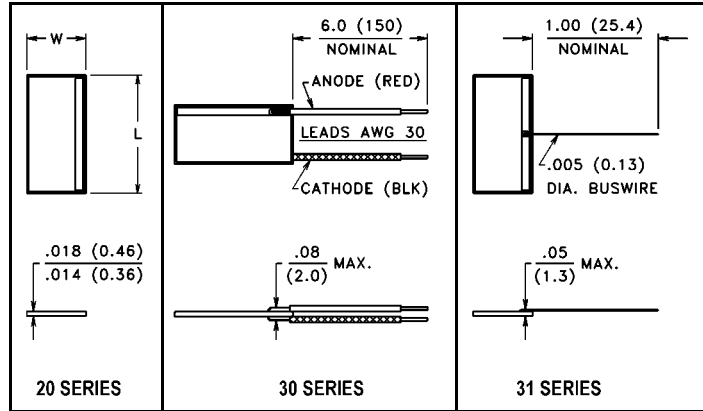
VTS Process Photodiodes

VTS__81, 83, 84

PRODUCT DESCRIPTION

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PACKAGE DIMENSIONS inch (mm)



ABSOLUTE MAXIMUM RATINGS

Storage Temperature:

- 40°C to 150°C Series 20, 31
- 40°C to 105°C Series 30

Operating Temperature:

- 40°C to 125°C Series 20, 31
- 40°C to 105°C Series 30

Reverse Voltage:

6.0 Volts

CASE 44C
ANODE (ACTIVE) SURFACE SHOWN
CATHODE IS BACKSIDE

DIMENSIONS	VTS__81	VTS__83	VTS__84
L	.800 (20.32)	.800 (20.32)	.400 (10.16)
W	.400 (10.16)	.200 (5.08)	.200 (5.08)
ACTIVE AREA	.290 ² (187 ²)	.132 ² (85 ²)	.065 ² (42 ²)

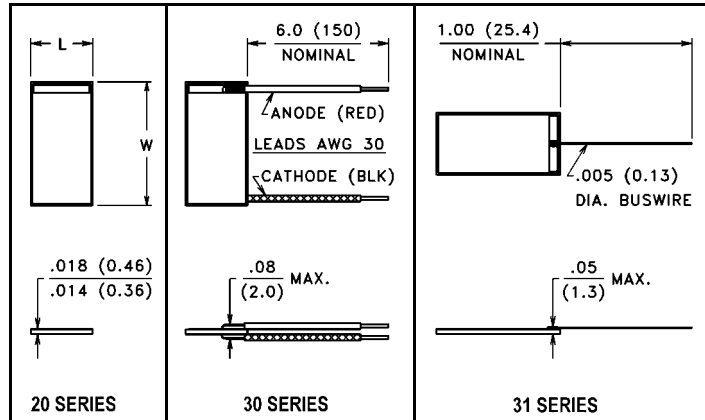
ELECTRO-OPTICAL CHARACTERISTICS @ 25°C (See also VTS curves, page 67)

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	VTS__81			VTS__83			VTS__84			UNITS
			Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	
I _{SC}	Short Circuit Current	H = 1000 lux, 2850 K	1.10	1.50		0.5	0.64		0.25	0.33		mA
TC I _{SC}	I _{SC} Temperature Coefficient	H = 1000 Lux, 2850 K		0.20			.20			.20		%/°C
I _D	Dark Current	H = 0, VR = 100 mV		100	500		50	200		40	100	nA
TC I _D	I _D Temp. Coefficient	H = 0, VR = 100 mV		+11			+11			+11		%/°C
R _{SH}	Shunt Resistance	H = 0, VR = 10 mV		0.6			1.2			1.5		MΩ
C _J	Junction Capacitance	H = 0, V = 0 V, 1 MHz		3.5			1.75			1.0		nF
S _R	Sensitivity	@ 400 nm	.18	0.20		0.18	0.20		0.18	0.20		A/W
Re	Responsivity	400 nm, 0.18 A/W		0.34			0.15			0.07		A/(W/cm ²)
TC V _{OC}	Sensitivity @ Peak	925 nm		0.60			0.60			0.60		A/W
t _R /t _F	Response Time @ 1 kΩ Load	VR = 1 V, 830 nm		6.4			3.4			1.8		μsec
V _{OC}	Open Circuit Voltage	H = 1000 Lux, 2850 K	0.25	0.45		0.25	0.45		0.25	0.45		Volts
TC V _{OC}	V _{OC} Temperature Coefficient	H = 1000 Lux, 2850 K		-2.6			-2.6			-2.6		mV/°C

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PACKAGE DIMENSIONS inch (mm)



ABSOLUTE MAXIMUM RATINGS

Storage Temperature:

-40°C to 150°C Series 20, 31

-40°C to 105°C Series 30

Operating Temperature:

-40°C to 125°C Series 20, 31

-40°C to 105°C Series 30

CASE 44B
ANODE (ACTIVE) SURFACE SHOWN
CATHODE IS BACKSIDE

DIMENSIONS	VTS__86
L	.100 (2.54)
W	.200 (5.08)
ACTIVE AREA	.015 ² (10 ²)

ELECTRO-OPTICAL CHARACTERISTICS @ 25°C (See also VTS curves, page 67)

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	VTS__86			UNITS
			Min.	Typ.	Max.	
I _{SC}	Short Circuit Current	H = 1000 lux, 2850 K	60	80		μA
TC I _{SC}	I _{SC} Temperature Coefficient	H = 1000 Lux, 2850 K		.20		%/°C
I _D	Dark Current	H = 0, VR = 100 mV		10	100	nA
TC I _D	I _D Temp. Coefficient	H = 0, VR = 100 mV		+11		%/°C
R _{SH}	Shunt Resistance	H = 0, VR = 10 mV		6.0		MΩ
C _J	Junction Capacitance	H = 0, V = 0 V, 1 MHz		0.25		nF
S _R	Sensitivity	@ 400 nm	.18	0.20		A/W
Re	Responsivity	400 nm, 0.18 A/W		0.02		A/(W/cm ²)
TC V _{OC}	Sensitivity @ Peak	925 nm		0.60		A/W
t _R /t _F	Response Time @ 1 kΩ Load	VR = 1 V, 830 nm		0.75		μsec
V _{OC}	Open Circuit Voltage	H = 1000 Lux, 2850 K	0.25	0.45		Volts
TC V _{OC}	V _{OC} Temperature Coefficient	H = 1000 Lux, 2850 K		-2.6		mV/°C